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ROSENBLUM ENVIRONMENTAL ENGINEERING
900 Dorthel Street, Sebastopol CA 95472

(707) 824-8070
fax (707) 824-8071
RoseEnvEng@aol.com

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COMMENTS ON THE COMMERCIAL/INDUSTRIAL ELEMENT IN CALFED'S WATER USE EFFICIENCY PROGRAM PLAN

John Rosenblum, Ph.D.

1. INTRODUCTION

Although my comments address a small fraction of the water considered by the CALFED plan, Commercial Industrial and Institutional (CII) usage, I believe that at least two general benefits to the CALFED process can be derived from them:

- Projects that identify and demonstrate multiple benefits can bring together seemingly irreconcilable interests.
- Very large improvements in water use efficiency can generate significant economic savings by paying attention to site-specific details.

The Silicon Valley Pollution Prevention Center's Industrial Water Efficiency program provides an example. The Center was created as part of the settlement of a long series of regulatory and legal battles, and brings together representatives of industry, government, and environmental organizations to seek collaborative approaches to reduce sources of pollution impacting the South San Francisco Bay. The focus of the Industrial Water Efficiency program is to evaluate and demonstrate the technical and economic feasibility of improving process water efficiency and

reducing wastewater discharges from high-technology manufacturing plants. The program began in 1997 and continues to address the interests of all participants in successive stages.

Two plants, a disc-drive manufacturer and a semiconductor Fab, initially volunteered for detailed evaluations. Currently, several disc drive plants are testing measures originally developed for optimizing semiconductor wafer rinsing. This site-specific approach has helped identify 60-80% reductions in plant-wide water demands (and wastewater discharges), derived from 30-60% reductions in process demands followed by 50-90% recycling of rinse wastewater. Based on these large reductions, savings in water purchases, Ultra Pure Water production, and sewer fees can pay for implementation within 2-3 years; when savings in process chemicals are added, the payback can be as short as 4 months.

I believe that paying more attention to site-specific details and local conditions, for all categories of water users, will improve CALFED's efficiency evaluations. Such an improvement will then help focus attention on potential benefits rather than on the sacrifices that different interests believe they are making to others.

2. COMMENTS

2.1 Include Larger Potential Reductions for CII

The *Draft Programmatic EIS/EIR Technical Appendix* estimates that reduction in unit[1] CII water demand for the year 2020 without CALFED intervention is 15%; with CALFED the reduction is expected to be 22%[2]. The 15% State reduction is derived from the expectation that residential water use will decline by 11% as urban BMP's[3] are implemented, with CII assumed to achieve 4% beyond the BMP's. The 22% reduction is derived from an EPA study of commercial water users[4], implying that Federal assistance would add 7% to the reductions expected from State programs.

The BMP's include very few measures for the CII sector, and none that effectively target the largest uses of water. For example, installation of ULF toilets addresses only a miniscule fraction of water usage in an industrial plant, and commonly accepted audits based on low cost "walk-throughs" miss the most significant reductions. My own experience in industry[5] is that cost-effective reductions of 50-90% are usually feasible, based on site-specific production-process improvements. My point here is that the assumption of 4% (or even 11%) in unit reductions beyond urban BMP's for the CII sector is far too low.

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[1] Unit reduction refers to the CII sector alone, in gallons per capita per day (gpcpd).

[2] The projections are DWR's from January 1998, calculated by multiplying urban per-capita water usage, total population, and fraction of CII usage, and then applying the reduction factor.

[3] Best Management Practices in the Memorandum of Understanding Regarding Urban Water Conservation in California, overseen by the California Urban Water Conservation Council (CUWCC), and revised in September 1997.

[4] *Study of Potential Water Efficiency Improvements in Commercial Business*, EPA 1997 (with DWR).

[5] Including the "hi-tech" sector (semiconductors, disc-drives, printed circuit boards, surface-finishing) and a wide variety of food-processing (dairy, meat and poultry, juices, tomato paste).

Even before addressing the issue of cost-effectiveness, it is possible to recognize the policy implications of underestimating CII reductions:

- Assuming that CII is 30% of total water demand, a 15% CII reduction translates into a total reduction of only 4.5%, which would have very little impact on infrastructure planning. Even with the 22% CII reduction projected with CALFED assistance, the total reduction would be only 6.6%. On the other hand, a 70% CII reduction would provide a 21% total reduction, which is far more significant.
- A 15% or even 22% reduction is smaller than the operational variability in water usage for most industrial plants, and is very hard to verify. Justification of water efficiency projects requires verification of reductions, costs, savings, from public and private perspectives. Projects aimed at 50-90% reductions can be easily verified and justified.
- The additional 4% or 7% unit CII reduction beyond urban BMP's might not be a high priority, but developing a CII water efficiency program to capture an additional 200-500% should be.

2.2 Add Industry Specifics to Regional Conservation Estimates

The regional estimations of CII reductions are all based on the same unnecessarily low unit CII reduction (see previous section), regardless of the differences in the mix of CII users. These differences might not be significant when only small reductions are expected from the CII sector, but become increasingly relevant with much larger reductions. Disaggregation based on location and type of industry will reveal the implication of these differences. For example, UR2-Eastside San Joaquin River includes many large food processors, while UR4-San Francisco Bay includes petroleum refineries and high technology plants. These industries have entirely different water demand profiles, wastewater loads, and potentials for efficiency improvements, on-site recycling, and off-site reclamation.

2.3 Add Unit Cost Estimates for Specific CII Measures

Unit cost estimates (in $/AF) are presented for 8 urban BMP measures[6], including only ULF toilets for the CII sector. CII audits are mentioned, but no costs are listed. My experience in industry is that in-depth, site-specific Pollution Prevention audits can identify very large reductions in water use resulting in negative unit costs (i.e. net savings, with payback periods of 0.5-3.0 years) for the company. Including the costs of the audits reduces the savings somewhat, but does not trigger costs anywhere near the values listed for the 8 BMP measures.

Even though the Pollution Prevention audits show net savings for the companies, the initial investment required usually raises internal organizational barriers. My experience is that funding from public programs for the audits and a fraction of implementation costs (at least for engineering and monitoring equipment) helps overcome such hurdles, and results in broader industry participation[7]. I have found that indexing public funding to the avoided costs of water

[6] Table 5-16 in the plan.

[7] Examples are (a) developing copper/nickel mass limits for industrial dischargers and subsequent Pollution Prevention Demonstration Projects by the Palo Alto Regional Water Quality Control Plant, (b) Pilot Pollution Prevention Studies, Heavy Metals Mass Audit Studies, the Nickel Initiative, and wastewater Flow Reduction

supply, municipal wastewater treatment, and area-wide reclamation projects still provides savings to ratepayers while closely approaching acceptable payback targets for industry.

Validating unit costs and evaluating the appropriate level of public funding are very important needs, which could benefit from CALFED assistance. This applies not only to the development of CII water efficiency measures, but to all urban BMP's and especially to municipal wastewater reclamation (where costs are highlighted as a major hurdle to implementation).

3. INTEGRATION OF CII MEASURES INTO STAGE 1 ACTIONS

3.1 Balance Funding Priorities

The recommendations for Stage 1 Actions in the Draft Program Plan are quite comprehensive and have the potential to address further development of the CII element in accordance with my comments. On the other hand, since budget priorities will determine what actually gets implemented, I was disappointed that the only reference to capital funding was $500 million for agricultural and urban wastewater reclamation[8]. I sincerely hope that other action items will also be recommended for capital funding, and not merely assigned whatever remains after reclamation.

I believe that comparisons between all the different water efficiency alternatives are essential for setting CALFED funding priorities, and necessary for public accountability. For example, section 2.2.4 describing CALFED's approach to providing incentives for wastewater reclamation does not explicitly require such comprehensive comparisons, but mentions the need to " ... *develop an incentive program that more closely fits the objectives and timelines of CALFED Stage 1 Actions.*" Since a key CALFED program objective is State-wide cost-effectiveness, funding and incentives for reclamation must be compared with funding for other alternatives, including CII measures.

3.2 Demonstrate CII Measures Beyond Urban BMP's

Demonstration of CII measures, not just their development, can be specifically integrated into several action items of section 2.3.1:

- Item 7 to "... *Develop an incentive based program to identify and implement urban water conservation measures that are supplemental to BMP's in the Urban MOU process and are cost effective from a statewide perspective.*" CII incentive programs could be based on the combined avoided costs for urban water supply, wastewater treatment, and reclamation. This would be similar to energy conservation incentives commonly provided by electric and natural

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Audits for industrial dischargers to the City of San Jose, and (c) developing CII water efficiency program for the City of Petaluma. Reports are available from the Silicon Valley Pollution Prevention Center, the Palo Alto Regional Water Quality Control Plant, the Bay Institute of San Francisco, and the City of San Jose's Environmental Services Department.

[8] Item 7 in section 2.3.1.

gas utilities[9]. My experience is that pilot projects help validate local cost-effectiveness; CALFED funding for implementation in several different areas would help demonstrate State-wide effectiveness.

- Item 11 to "...*Encourage and support research to expand potential water use efficiency measures.*" Ample research on efficiency measures is already available for many different industrial processes; what is missing in order to expand implementation are plant-wide demonstration projects that include all water uses, not just 1-2 individual processes. CALFED funding for several such projects would help expand implementation of CII measures, and not just in California.
- Item 13 to "... *Develop legislation for water measurement ... that requires appropriate measurement ... for all water users ...*" Monitoring is essential for verifying performance and cost-effectiveness of all water efficiency measures, both from a business perspective and for public incentive programs. My experience is that measurement has been inadequate for many CII projects and incentive programs; CALFED funding of monitoring equipment could help overcome this problem and, at the same time, demonstrate appropriate measurement procedures.

Section 2.3.3 to develop better information should include support for specific CII measures, especially "*... New efficiency technologies and their potential to affect water use ... The economics of water recycling ... The effects of source water quality on the costs of producing recycled water.*" Again, my experience is that results from demonstration projects validating performance and cost-effectiveness are more important than general technical information. Thus CALFED funding of CII demonstration projects, especially for adequate monitoring, will jointly achieve the goals of sections 2.3.1 and 2.3.3.

3.3 Include CII Measures in Policy Evaluations

Some CII measures require policy changes and/or public funding, and should be specifically included in the action items of section 2.3.1:

- Item 4 to "... *Create a public advisory committee ... for maximum effectiveness of program expenditures ...*" A key issue will be prioritizing support for different agricultural, residential, and CII measures; this will require, first and foremost, broad-based participation in the committee[10]. The second requirement is to develop common parameters for comparing the cost-effectiveness of different efficiency and recycling measures. In my experience, several criteria must be selected to account fairly for differences between different water users and other interests. An example for evaluation of CII programs is that CII volumes might be insignificant compared to agricultural and residential uses, but because unit costs are often negative (i.e. net savings), total program expenditures for water efficiency could be reduced by an aggressive CII element.

[9] In this case, avoided unit costs to water/wastewater ratepayers might represent an upper limit for incentives, with the proponents of different projects bidding competitively for partial funding (section 2.2.4 mentions this as a possible basis for providing reclamation incentives).

[10] Including not only representatives of direct users, but also environmental and community organizations supporting in-stream and public-trust benefits.

- Item 6 to "... *Implement an urban best management practices certification process ... with respect to analysis and implementation ...*" In my opinion, certification would be incomplete without a specific CII component, especially since CALFED support is also aimed at developing supplemental measures to existing residential BMP's.
- Item 12 to "... *evaluate the need for additional state regulations ... providing protection for water rights holders who have implemented water use efficiency measures and subsequently transferred water to other beneficial uses.*" This should include a specific evaluation of CII reductions and flexibility to meet future CII demands, especially since water rights transfers could provide significant revenues to support public expenditures for efficiency programs.

4. SUMMARY

- ✓ Reductions from CII efficiency programs are much larger than assumed in the draft.
- ✓ Disaggregation of regional CII efficiency programs will reveal much larger reductions than estimated in the draft.
- ✓ Unit costs of CII efficiency measures are much smaller (and often generate net savings) than for residential efficiency or urban wastewater reclamation.
- ✓ Stage 1 Actions must include balancing funding priorities by comparing the cost-effectiveness of all the different water efficiency programs.
- ✓ Stage 1 Actions should include funding for local CII demonstration projects.
- ✓ Policy evaluations in Stage 1 Actions should include specific CII components.